0

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/008,864	12/06/2001	Cary Lee Bates	CA920010004US1	5046

7590 03/28/2006

Grant A. Johnson
IBM Corporation
Dept. 917
3605 Highway 52 North
Rochester, MN 55901-7829

EXAMINER	
ROMANO, JOHN J	

ART UNIT	PAPER NUMBER
2192	

DATE MAILED: 03/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	**Application No.** 10/008,864	**Applicant(s)** BATES ET AL.	
	Examiner John J. Romano	**Art Unit** 2192	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 March 2006*.

2a)□ This action is **FINAL**. 2b)☒ This action is non-final.

3)□ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4,5,7-12 and 25-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)□ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,5,7-12 and 25-32* is/are rejected.

7)□ Claim(s) _____ is/are objected to.

8)□ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)□ The specification is objected to by the Examiner.

10)□ The drawing(s) filed on _____ is/are: a)□ accepted or b)□ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)□ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)□ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)□ All b)□ Some * c)□ None of:

1.□ Certified copies of the priority documents have been received.

2.□ Certified copies of the priority documents have been received in Application No. _____.

3.□ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) □ Notice of References Cited (PTO-892)

2) □ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) □ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) □ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) □ Notice of Informal Patent Application (PTO-152)

6) □ Other: _____.

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 06th, 2006, has been entered.

Applicant's amendment and response received March 06th, 2006, responding to the July 26th, 2005, Office action provided in the rejections of claims 1, 3-11 and 13-24, wherein claims 1, 4, 7, 8, 12 and 25 have been amended and new claims 28-32 added. Claims 1, 2, 4, 5, 7-12 and 25-32, remain pending in the application and which have been fully considered by the examiner.

Prior Art's Arguments – Rejections

2. Applicant's arguments filed March 06th, 2006, in particular on pages 8-11, have been fully considered but they are not persuasive. For example,

(A) In response to applicant's argument that *Wygodny* fails to disclose monitoring execution to **detect references (or accesses) to a memory location representing the trigger expression**, and storing the state of the trigger expression responsive to detecting such a reference, as recited in applicants' amended independent claims (page 11, second paragraph of the amendment and response), the examiner respectfully disagrees. Applicant contends that *Wygodny* is referring to the **data that is collected with the trace, not the event which triggers collection of data** (page 10, last paragraph). However, the plain language of the claim, merely states "*detect occurrences of a plurality of references to a location in machine memory representing a state of said trigger expression*", wherein the cited claim language can be reasonably interpreted to be data collected (state variables) upon the occurrence of a reference to a location in memory (the triggering expression), which represents a state (value at time of occurrence), of said trigger expression. Wygodny discloses:

- "*The developer 112 may also select which* ***variables*** *(e.g., local variables, global variables, static variables, etc.) should be traced for each traced line.*" (E.g., see Figure 5 & Column 15, lines 52-55), wherein the developer may select which variables or expressions to be traced, wherein the execution of the traced variable triggers the trace.

Therefore, upon accessing a memory location, which represents a triggered expression, *Wygodny* certainly discloses storing the state (value of the triggering expression), responsive to detecting a memory reference as argued by Applicant (page 11, third paragraph of the amendment and response).

(B) In regard to Applicants' argument that *Lindsey* does not teach or suggest, alone or in combination with *Wygodny*, that the triggering event which causes state data to be collected is a reference to a memory location corresponding to a triggering expression input by a user (page 11, fourth paragraph of the amendment and response), the examiner respectfully disagrees. As addressed above in section (A), Wygodny teaches a triggering event (memory access), which causes state data to be collected, wherein the memory location state data is recorded when accessed and thus corresponds to the triggering event. Thus, the examiner maintains the rejection in light of the instant arguments.

Additional Comments:

The examiner has a duty and responsibility to the public and to Applicant to interpret the claims as broadly as reasonably possible during prosecution. In re Prater, 56 CCPA 1381, 415 F.2d 1393, 162 USPQ 541, 1969.

Although the claims are read in light of the specification, the specification is not read into the claims. The examiner recommends clarifying the triggering expression event to not read on a variable access. It is also noted that, for example, a break point or trace point is read on a "trigger expression".

Claim Rejections

Claims 1, 2, 4, 5, 7-12 and 25-32, are pending claims, stand finally rejected in light of the additional clarifications provided and/or addressed at item 2 above, Prior Art's Arguments – Rejections, and the claim rejections below.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language

3. Claims **1, 4, 5** and **7-11** are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Wygodny et al., US 6,282,701 B1, (hereinafter **Wygodny**).

In regard to claim **1**, **Wygodny** discloses:

- "*A method of tracing the activity of an expression, said method comprising the steps of ...*" (E.g., see Figure 1C & Column 2, line 59-Column 3, line 1), wherein the data element may be a variable.
- "*... (a) specifying a machine-implemented process in which a trigger expression is to be traced...*" (E.g., see Figure 5 & Column 12, lines 44-47), wherein the trade option window allows the developer to specify which functions or machine-implemented process to trace.
- "*... (b) specifying the trigger expression to be traced in the machine-implemented process ...*" (E.g., see Figure 5 & Column 15, lines 52-55), wherein the developer may select which variables or expressions to be traced, wherein the execution of the traced variable triggers the trace.

- "*...(c) monitoring execution of said machine-implemented process to detect occurrences of a plurality of references to a location in machine memory representing a state of said trigger expression occurring as a result of executing said machine-implemented process...*" (E.g., see Figure 1B & Column 3, lines 7-12), wherein a program monitors activity during execution.
- "*...(d) responsive to each detected occurrence of a reference to said location in machine memory representing a state of said trigger expression, storing the respective state of the trigger expression at the time of the respective detected occurrence of a reference to said location in machine memory representing a state of said trigger...*" (E.g., see Figure 1C & Column 26, lines 33-34), wherein the breakpoint is triggered whenever the target address gets executed or is active. The interrupt then causes the variable or expression to be recorded.
- "*...to create a history of said trigger expression within the machine-implemented process, said storing step being performed without interrupting the machine-implemented process...*" (E.g., see Figure 1C & Column 26, line 33-34), wherein the trigger happens whenever the address is executed (detected) which inherently includes a read/write operation (call to memory). Causing a plurality of expressions to be stored (history).

- "*...(e) restoring the state of the trigger expression when requested.*" (E.g., see Figure 1C & Column 7, lines 39-43), wherein the developer analyzes the trace data.

In regard to claim **4**, the rejections of base claim **1** are incorporated. Furthermore, **Wygodny** discloses:

- "*...(a) displaying the history such that the state of the trigger expression each time the trigger expression was active can be displayed separately.*" (E.g., see Figure 1C & Column 8, lines 15-20), wherein the data stored or history is displayed according to filters set by the user allowing the user to display a particular triggered expression separately if desired.

In regard to claim **5**, the rejections of base claim **1** are incorporated. Furthermore, **Wygodny** discloses:

- "*...results in an L value during the machine-implemented process.*" (E.g., see Figure 1C & Column 8, lines 7-8), wherein the trace data may be a variable associated with an assembly address (memory location).

In regard to claim **7**, the rejections of base claim **1** are incorporated. Furthermore, **Wygodny** discloses:

- "*...reference to said location in machine memory representing a state of said trigger expression is a Read and/or a Write.*" (E.g., see Figure 1C & Column 26, line 33-34), wherein the trigger happens (reference to said location representing a state of the trigger expression) whenever the address is executed which inherently encompasses a read and write operation (call to memory).

In regard to claim **8**, the rejections of base claim **1** are incorporated.

Furthermore, **Wygodny** discloses:

- "*...(a) specifying at least one attached expression; (b)...storing the respective state of the at least one attached expression ... within the machine-implemented process; and (c) restoring the state of the at least one attached expression when requested.*" (E.g., see Figure 3A & Column 18, lines 30-43), wherein the developer can choose any arguments, return values and selected source lines, thereby storing the state of a chosen function and respective attached expressions or variables, wherein trace can then be displayed according to the developers choice (restoring) when requested.
- "*...responsive to each detected occurrence of a reference to said location in machine memory representing a state of said trigger expression...*" (E.g., see Figure 1C & Column 26, line 33-34), wherein the trigger happens (activity) whenever the address is executed (reference to memory).
- "*... at the time of the respective detected occurrence of a reference to said location in machine memory representing a state of said trigger expression, the states of the at least one attached expression being*

<u>*associated with said history of said trigger expression*</u>*...*" (E.g., see Figure 1C & Column 26, lines 33-34), wherein the breakpoint is triggered whenever the target address gets executed or is active. The interrupt then causes the variable or expression to be recorded (history).

In regard to claim **9**, the rejections of base claim **1** are incorporated.

Furthermore, **Wygodny** discloses:

- "*...the machine-implemented process is a computer program.*" (E.g., see Figure 6 & Column 5, lines 20-23), wherein the user can trace a program.

In regard to claim **10**, the rejections of base claim **1** are incorporated.

Furthermore, **Wygodny** discloses:

- "*...included in an object level trace program.*" (E.g., see Figure 6 & Column 4, lines 43-50), wherein included in a trace program which may trace object code as disclosed.

In regard to claim **11**, the rejections of base claim **1** are incorporated.

Furthermore, **Wygodny** discloses:

- "*...included in a debug program.*" (E.g., see Figure 1A & Column 4, lines 43-50), wherein the invention provides debugging of a computer program.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims **2, 12** and **25-32** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Wygodny** in view of Lindsey, US 5,896,536 (hereinafter **Lindsey**).

In regard to claim **2**, the rejections of base claim 1 are incorporated. But **Wygodny** does not expressly disclose "...imposing a condition onto the trigger expression and storing the state of the trigger expression only when the condition is satisfied. However, **Lindsey** discloses:

- "...*(a) imposing a condition onto the trigger expression; and (b) storing the state of the trigger expression only when the condition is satisfied.*" (E.g., see Figure 6 & Column 8, lines 39-48), wherein a tracing operation is stored when a predetermined condition is detected (satisfied).

Wygodny and **Lyndsey** are analogous art because they are both concerned with the same field of endeavor, namely, tracing the execution path of a computer program. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to impose a trigger condition on **Wygodny's** tracing. The motivation to do so would have been to monitor the execution of the code based on selections or options from the user as suggested by **Wygodny** (Column 3, lines 7 –12), wherein the conditional trigger or expression would provide the user with further options. Furthermore, **Lyndsey** suggests "...the ability to trigger the generation of trace data based upon a specific data component so that information can be obtained relative to the data component during execution of logic units would be a valuable tool for developers in the debugging of programs". Thus it would have been obvious, to a person of ordinary skill in the art to include a conditional trace-point or trigger with **Wygodny's** tracing method.

In regard to claim **12**, **Wygodny** discloses:

- "*A method of tracing the activity of an expression in an executing computer program...*" (E.g., see Figure 2 & Column 4, lines 43-44), wherein a computer program being executed is traced.
- "*...(a) specifying the computer program in which a trigger expression resulting in an L value during the execution of the computer program is to be traced...*" (E.g., see Figure 1C & Column 8, lines 7-8), wherein the trace data may be a variable associated with an assembly address (memory location).

- "*...(b) specifying the trigger expression and any optional attachment expressions to be traced in the computer program...(f) creating a profile of the trigger expression comprising storing each snapshot; (g) displaying the profile such that each snapshot can be displayed separately; and (h) restoring the state of each snapshot, when requested.*" (E.g., see Figure 3A & Column 18, lines 30-43), wherein the developer can choose any arguments, return values and selected source lines, thereby storing the state of a chosen function and attached expressions or variables (profile), wherein trace can then be displayed according to the developers choice (restoring) when requested.

But **Wygodny** does not expressly disclose "imposing a condition onto the trigger expression. However, **Lyndsey** discloses:

- "*...(c) imposing a condition onto the trigger expression...*" (E.g., see Figure 6 & Column 8, lines 39-48), wherein a tracing operation is stored when a predetermined condition is detected (satisfied).

Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to impose a trigger condition on **Wygodny's** tracing. The motivation to do so would have been to monitor the execution of the code based on selections or options from the user as suggested by **Wygodny** (Column 3, lines 7 –12), wherein the conditional trigger or expression would provide the user with further options. Furthermore, **Lyndsey** suggests "...the ability to trigger the generation of trace data based upon a specific data component so that information can be obtained relative to the data component during execution of logic units would be a valuable tool for developers in the debugging of programs". Thus it would have been obvious, to a person of ordinary skill in the art to include a conditional trace-point or trigger with **Wygodny's** tracing method. See Claim 1 for remaining limitations.

In regard to claim **25, Wygodny** discloses:

- "*...(a) initiating a user interface to exchange data input/output with a user and an electronic processing apparatus...*" (E.g., see Figure 1C & Column 2, line 59-Column 3, line 1), wherein the user interface is initiated after the user starts the program.
- "*...(b) requesting a trigger expression from a user...*" (E.g., see Figure 5 & Column 13, lines 50-54), wherein the developer may specify which variables or expressions to be traced (520), wherein the execution of the traced variable triggers the trace. Furthermore, the developer opens a window that requires, or requests, the developers input.
- "*...(c) requesting a program identification of a program in which the trigger expression is to be traced...*" (E.g., see Figure 5 & Column 12, lines 44-47), wherein the trade option window allows the developer to specify, (requests from the user), which functions or machine-implemented process (program) to trace.
- "*...(d) causing the electronic processing apparatus to execute the identified program; (f)...storing the respective state of the trigger*

expression..." (E.g., see Figure 1C & Column 26, line 33-34), wherein the trigger happens (activity), storing the state of the trigger expression, whenever the address is executed (memory operation), which takes place while the identified program is executing.

- "...*(g) maintaining the capability to restore each snapshot and display each snapshot to the user.*" (E.g., see Figure 1C & Column 8, lines 15-20), wherein the data stored or history is displayed (restored) according to filters set by the user allowing the user to display a particular triggered expression separately if desired.

But **Wygodny** does not expressly disclose "...an article of manufacture, comprising a data storage medium tangibly embodying a program of machine readable instructions executable by an electronic processing apparatus...". However, **Lyndsey** discloses:

- "*An article of manufacture, comprising a data storage medium tangibly embodying a program of machine readable instructions executable by an electronic processing apparatus...*" (E.g., see Figure 1 & Column 4, lines 48-61).

Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to embody **Wygodny's** tracing instructions on an article of manufacture. The motivation to do so would have been to send the tracer program to the client as suggested by **Wygodny** (Column 3, lines 30-32), wherein the developer would not need to visit the remote site. Thus it would have been obvious, to a person of ordinary skill in the art to include a **Wygodny's** tracing program on an article of manufacture. See claim 1 for remaining limitations.

In regard to claim **26**, the rejections of base claim **20** are incorporated. But, **Wygodny** does not expressly disclose "*...requesting the user to assign conditions to the trigger expression*". But **Lyndsey** discloses:

- "*...requesting the user to assign conditions to the trigger expression whereupon when the conditions are satisfied, a snapshot of the trigger expression is stored.*" (E.g., see Figure 5, (86) & Column 6, lines 59-61), wherein a tracing operation is stored when a predetermined condition is detected (satisfied), wherein the predetermined condition was input from the user (requested from the user) via the if condition (Figure 5, block 86).

Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to impose a trigger condition on **Wygodny's** tracing. The motivation to do so would have been to monitor the execution of the code based on selections or options from the user as suggested by **Wygodny** (Column 3, lines 7 –12), wherein the conditional trigger or expression would provide the user with further options. Furthermore, **Lyndsey** suggests "...the ability to trigger the generation of trace data based upon a specific data component so that information can be obtained relative to the data component during execution of logic units would be a valuable tool for developers in the debugging of programs". Thus it would have been obvious, to a person of ordinary skill in the art to include a conditional trace-point or trigger with **Wygodny's** tracing method.

In regard to claim **27**, the rejections of base claim **25** are incorporated. Furthermore, **Wygodny** discloses:

- "*...requesting the user to indicate attached expressions whose states are also stored in a corresponding snapshot whenever a snapshot is stored for the trigger expression.*" (E.g., see Figure 3A & Column 18, lines 30-43), wherein the developer can choose any arguments, return values and selected source lines, thereby storing the state of a chosen function and attached expressions or variables (profile), wherein trace can then be displayed according to the developers choice (restoring) when requested.

In regard to claims **28-30**, this is a digital data processing device version of the article of manufacture claims that have been addressed in the above claims **25-27**, wherein all claimed limitations have also been addressed and/or cited as set forth above.

In regard to claim **31**, the rejections of base claim **28** are incorporated. Furthermore, **Wygodny** discloses:

- "*...execute on the same computer.*" (E.g., see Figure 1B & Column 5, lines 37-53), wherein the device that does the tracing (trace library, (102)) is on the clients computer.

In regard to claim **32**, the rejections of base claim **28** are incorporated. Furthermore, **Wygodny** discloses:

- "*...the first computer program and the second computer program execute on separate units connected by a data communications link.*" (E.g., see Figure 2 & Column 6, lines 55-65), wherein the device that does the tracing (trace library, (124)) is separated from the digital logic device and connected by a data communications link as shown.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John J. Romano whose telephone number is (571) 272-3872. The examiner can normally be reached on 8-5:30, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam can be reached on (571) 272-3695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TUAN DAM
SUPERVISORY PATENT EXAMINER